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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------|-------------|----------------------|---------------------|------------------|
| 10/507,432 | 02/10/2005 | Bernd Bauer | 26334 | 6276 |
| 20529 | 7590 | 01/26/2006 | | |
| NATH & ASSOCIATES | | | EXAMINER | |
| 112 South West Street | | | CHOI, LING SIU | |
| Alexandria, VA 22314 | | | ART UNIT | PAPER NUMBER |
| | | | 1713 | |

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

(An)

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/507,432 | BAUER ET AL. | |
| | Examiner | Art Unit | |
| | Ling-Siu Choi | 1713 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 07 November 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 26,29,31-38,40-44,47-49,51,53,55,57,58 and 61-86 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 26,29,31-38,40,57,58,61-72 and 83-86 is/are rejected.
- 7) Claim(s) 41-44,47-49,51,53,55 and 73-82 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

1. This Office Action is in response to the Amendment filed November 7, 2005. Claims 1-25, 27-28, 30, 39, 45-46, 50, 52, 54, 56, and 59-60 were canceled and claims 62-86 have been added. Claims 26, 29, 31-38, 40-44, 47-49, 51, 53-, 55, 57-58, and 61-86 are now pending, wherein claims 26 and 64 are independent claims. The rejections of claims 41-44, 47-49, 51, 53, 55 under 35 USC § 103 were withdrawn. The rejections of claims 26, 29, 31-38, 40, 57-58, and 61 are maintained.

Claim Objections

2. Claims 36, 44, and 64 are objected to because of the following informalities: (a) claim 36, line 5, "polyvinylidenefluoride" is suggested to be changed to -- polyvinylidenefluoride--; (b) claim 44, line 5, "polyvinylidenefluoride" is suggested to be changed to—polyvinylidenefluoride--; (c) claim 64, line 7, " $0 \leq x \leq 2$ " is suggested to be changed to -- $0 \leq X \leq 2$ --.

Appropriate correction is required

Claim Rejections - 35 USC § 112

3. **The following is a quotation of the second paragraph of 35 U.S.C. 112:**

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 64-86 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 64, lines 5-7, the recitation "zirconium phosphate sulfoarylene phosphonate of the general formula $Zr(O_3POH)_{2-x} (O_3P-Ar)_x$; wherein Ar is a sulfoarylene group and $0 \leq X \leq 2$ " causes indefiniteness because when $X=0$, the formula does not represent zirconium phosphate sulfoarylene phosphonate.

Claims 83-84, line 1, the recitation "Composite membrane material of claim 73" causes indefiniteness because claim 73 is drawn to "a method" and not to "composite membrane material".

Claim 85, lines 1-2, the recitation "a composite membrane material according to claim 73" causes indefiniteness because claim 73 is drawn to "a method instead of "composite membrane material".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 26, 29, 32-36, 40, and 57-63 are rejected under 35 U.S.C. 102(b) as being anticipated by Grot et al. (US 5,919,583).

| | | |
|---|--------------------|--|
| an ion conducting composite direct methanol fuel cell membrane material consisting of | | |
| A | a polymer matrix | |
| B | oriented particles | layered type proton conducting zirconium phosphate [Zr(O ₃ POH) ₂] or zirconium phosphate sulfoarylene phosphonate |
| wherein the particles are presented in a mixtures of large and small dies and are exfoliated to a thickness from ca. 5 nm to 100 nm | | |

(summary of claim 26)

| | | |
|---|--|--|
| an ion conducting composite direct methanol fuel cell membrane material consisting of | | |
| A | a polymer matrix | |
| B | a mixture of large and small lamellar oriented particles | layered type proton conducting zirconium phosphate sulfoarylene phosphonate[Zr(O ₃ POH) _{2-x} (O ₃ P-Ar) _x] with Ar is a sulfoarylene group and 0 ≤ X ≤ 2 |
| wherein the particles are exfoliated to a thickness from 5 nm up to 100 nm and exhibit a surface up to 10 μm ² | | |

(summary of claim 64)

The rejection is adequately set forth in paragraph 6 of the previous Office Action and is incorporated herein by reference.

7. Claims 26, 29, 31-38, 57, 58, 61-72, and 83-86 are rejected under 35

U.S.C. 102(b) as being anticipated by Bonnet et al. [Journal of New Materials for Electrochemical Systems, 3, 87-92(2000)].

The rejection is adequately set forth in paragraph 7 of the previous Office Action and is incorporated herein by reference.

Response to the Applicants' Arguments

8. Applicants' Amendment filed November 7,2005 have been fully considered but they are not persuasive.

Applicants, "Grot et al. teaches the zirconium phosphate within membrane prepared by precipitating within a polymer solution."

It is noted that claims 26, 29, 31-38, 40, 57-58, 61-72, and 83-86 are drawn to membrane material. The case law held that "The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed.Cir. 1985).

Conclusion

9. Claim 41-44, 47-49, 51, 53, 55, and 73-82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record of Grot et al. (US 5,919,583) and Bonnet et al. [Journal of New Materials for Electrochemical Systems, 3, 87-92(2000)], either alone or in combination, fails to teach or suggest a method to make a membrane material by removing a solvent from a mixture containing the colloidal dispersion of layered particles and the polymer.

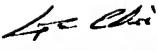
10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.


LING-SUI CHOI
PRIMARY EXAMINER

January 20, 2006